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## **PART B: SCIENCE INSTRUCTIONAL ADAPTATIONS FOR STUDENTS WITH LIMITED ENGLISH PROFICIENCY**

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### **INTRODUCTION**

New learners of English are often overwhelmed by the language and culture of a new school setting. Most students entering New Jersey schools from other countries have acquired the ability to think, speak, and reason in their home languages. However, they come with various levels of schooling and life experiences. These factors, along with differences in learning styles and physical, social, and intellectual abilities, affect the students' progress in learning and must be considered in the design and delivery of their instructional programs. This chapter of the framework provides teachers of students with limited English proficiency (LEP) with examples and illustrations of specific adaptations for teaching in the content areas.

#### **Who are limited English proficient (LEP) students?**

- **Students moving to the United States from other countries whose native language is not English.**
- **Students coming from homes where the first language is not English.**
- **Students having difficulty speaking, reading, writing, and understanding the English language.**

Providing students who are linguistically and culturally diverse with an appropriate education is a national concern. The growing numbers of learners who are considered to be linguistically diverse represent a 38% increase over the past 10 years (*Census Reports*, 1993). A comparison of the Bilingual/ESL program enrollment in New Jersey between September 1987 and October 1997 shows that the number of limited English proficient students increased 41 percent during the 10-year period. New Jersey now ranks seventh in the nation in the number of LEP students. This diversity is further distinguished in the range of circumstances that inform students' identification as second language learners. With such vast differences in the demographic backgrounds of the students, teachers must have access to and use a variety of strategies and materials to address the individual needs of the learners.

Identifying the primary language and assessing the relative English and native language proficiency of students is a critical first step in providing LEP students with an effective language support program. These students vary greatly in their readiness for school, and this initial process of identification and assessment will enable educators to adapt the learning experience to the appropriate skill level of their students. When such practices are not followed, instruction is not as effective, and students struggle in misguided programs with little benefit. For students to prosper in their educational program, teachers need to know who their LEP students are and what these learners know and can do.

## THE PURPOSE OF ADAPTATIONS FOR ENGLISH LANGUAGE LEARNERS

Research supports the notion that children from different cultures or different economic levels differ meaningfully in how they learn. When the native language of the learner is different from the dominant language of the classroom, these differences become all the more pronounced. Regular classroom teachers need to be familiar with and have access to the literature that describes the educational needs of these students. In addition, all teachers, including mainstream educators and bilingual/ESL teachers, must work collaboratively in the sharing of ideas, strategies, and resources for making appropriate adaptations.

The purpose of adapting content lessons for English language learners is to lower the language barrier and make the English used in such lessons as comprehensible as possible. Two factors affect the comprehensibility of language:

- the degree to which the language used is contextualized through visible situations, and
- the level of text familiarity to the student's background knowledge and experience.

Thus, to be successfully communicative, the lessons must be designed to build upon the students' background knowledge and to rely on nonlinguistic cues so that LEP students can comprehend the material and the teacher's messages.

Students' initial progress will also depend on the level of literacy each attained in his or her first language. If a student is a good reader in L1 (the first language), he or she will be a good reader in L2 (the second language). Conversely, if a student is a poor reader in L1, then the same will hold true for L2. A major goal in bilingual education, therefore, is to ensure that while a student is learning a new language, cognitive development and literacy continue to develop without interruption.

## INSTRUCTIONAL STRATEGIES FOR THE LEP STUDENT

Adaptation strategies will vary depending on the language proficiency level of the LEP student. Initially, these learners understand little in English and will respond by guessing from context what is expected or by imitating other students. At this stage, the teacher should provide many visual cues, such as pictures, videos, filmstrips, picture books, and demonstration lessons, to aid understanding.

With increasing exposure to English, the LEP student will begin to understand simple language but may not be ready to produce language. During this "silent period," rather than force speaking, the teacher should focus on making speech comprehensible to the student by using simple language and visual aids. For example, the teacher says, "Open your book," as the student listens and observes the

teacher opening a textbook. This concurrent demonstration of behavior and modeling of spoken language enables the student to develop constructs (that is, to think) in English.

As the student begins to produce language, he or she will imitate words and phrases used by the teacher and other students but will make many errors. The teacher should support the student's efforts by responding positively to build self-confidence and correcting errors sensitively and judiciously. At this stage, the teacher continues to engage the learner in many classroom activities and asks him or her to respond to questions nonverbally or with simple one-word or short-phrase utterances. Evaluation of student's progress should focus on measuring understanding rather than production.

As the student begins to use speech creatively (spontaneously using previously learned language in a new way), he or she may continue to make many grammatical mistakes and have trouble understanding and producing the complex structures of academic language, even though he or she may appear or sound fluent in a social setting. The continuing aim should be to lower the language barrier by making classroom communication simple and clear. Information should be presented visually by means of graphic organizers, such as semantic webs, charts, and graphs as well as pictures. All students, particularly second language learners, should be encouraged to work in small-group activities, which provide ongoing opportunities to build language proficiency, self-confidence, and respect for the ideas of others. Keep in mind that being limited in English is a temporary situation and that students are capable of attaining full fluency in the language. A student's capacity to become fluent in English will be greatly enhanced by activities in oral and written language that connect to one's own life in meaningful and engaging ways.

The chart on the following page lists strategies to make classroom communication comprehensible to the LEP student. Many of these strategies are exemplified in the sample adaptations included at the end of this chapter.

### **GOOD TEACHING PRACTICES**

1. Learn the backgrounds of LEP students and, working with the ESL/bilingual teacher, plan a lesson that is both culturally and linguistically appropriate.
2. Group students flexibly, in small groups based on individual or group interests as well as instructional need or ability. These groups should be fluid and change, depending on the lesson objectives.
3. Give clear, simple directions to LEP students. Ask them to retell, in their own words, what you are asking them to do before they attempt a task.
4. Model a “lead and support” strategy where the content teacher leads the lesson as the ESL/ bilingual educator provides background information and examples that support the lesson.
5. Model a “shadow” strategy where the ESL/bilingual educator reiterates in the student’s native language or in simplified English the key concepts learned in content areas.
6. Paraphrase information and main ideas.
7. Reorganize and reinforce information.
8. Provide bilingual classroom resources, such as bilingual dictionaries, picture books and dictionaries, and English language encyclopedias for LEP students.

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### **Preparing the Students for the Lesson**

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LEP students need to develop a clear understanding of the teacher’s lesson objectives (e.g., Students will be able to understand the stages of the water cycle, the causes of the Civil War, or how to write a descriptive paragraph). They also need instruction that presents the main concepts of the lesson in a clear, concrete, and comprehensible manner and that excludes all nonessential or ancillary information. Help students conceptualize classroom lessons by translating ideas into concrete form through hands-on activities (e.g., conducting science experiments, recording notes in a learning log, or conducting an interview).

Because LEP students have such varied educational and life experiences, they may need more comprehensive background information than other students. Teachers should not take for granted that these learners will understand or have experience with some of the concepts being taught. The content area teachers should work with bilingual/ESL educators to identify specific problems confronting these students. Instructional preparation should also focus on:

**Building background information.** This can be done through brainstorming; semantic webbing; use of maps, photos, and illustrations; and use of the KWL strategy.

**Simplifying language for presentation.** Teachers can use “sheltered English,” in which they make content-specific language more comprehensible for LEP students by using short, simple syntactic structures; introducing one concept per sentence; limiting structures to one tense; using the active voice; substituting common words for unfamiliar vocabulary; and eliminating any unnecessary language or ideas.

**Developing content area vocabulary.** Vocabulary specific to the content area may be developed through various activities, including the following:

- starting a picture dictionary or word bank
- teaching the vocabulary appropriate to a given subject before introducing the content
- reviewing and reinforcing the vocabulary during the content activities
- labeling objects in the classroom
- taping vocabulary words in context so that students learn to recognize the words
- using realia (actual objects, such as a variety of foods or textures) as tools for teaching so that vocabulary becomes real and tangible
- encouraging students to use a dictionary to learn or confirm word meanings

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### Giving Directions

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Routines help create a secure learning environment in which LEP students are able to anticipate what will happen without having to rely solely on language cues. Expectations and routines such as arriving on time or checking homework should be communicated clearly and positively early in the school year so students have these structures to guide them. Working with buddies and peer tutors will also help second language learners acclimate to the school and classroom settings and routines.

Directions should be stated clearly and distinctly and delivered in both written and oral forms to ensure that LEP students understand the task. Students with limited English proficiency are further supported when they have access to a list of commonly used “directional” words such as *circle*, *write*, *draw*, *cut*, *read*, *fix*, *copy*, *underline*, *match*, *add*, and *subtract*. Students can work with a buddy or on their own to find these action words in a picture dictionary and to create their own illustrated file of direction words for future use.

## Presenting the Lesson

Because LEP students present such different learning styles and individual needs, teachers should incorporate a variety of strategies in daily classroom activities to ensure that instruction communicates meaningfully to each student. By using multiple strategies and varied instructional tools, teachers increase the opportunities for students to develop meaningful connections between the content and the language used in instruction.

## Teaching Strategies

- Simplify vocabulary and sentence structure so that language is uncomplicated and manageable. For example, substitute “begins” for “originates” or “People think” rather than “It is believed” for those students less able to grasp the language structure.
- Build connections and associations that link new knowledge to what students already know about a subject.
- Provide concrete examples through hands-on activities and techniques that make abstract concepts more comprehensible and enable students to construct meaning. Examples are listed in the chart below.

|                           |                           |                               |                                  |                               |
|---------------------------|---------------------------|-------------------------------|----------------------------------|-------------------------------|
| <b>graphic organizers</b> | <b>charts and graphs</b>  | <b>surveys and interviews</b> | <b>drawing and illustrations</b> | <b>response journals</b>      |
| <b>posters</b>            | <b>simulations</b>        | <b>labeling</b>               | <b>tape recordings</b>           | <b>word banks</b>             |
| <b>games and puzzles</b>  | <b>student-made flash</b> | <b>student-made books</b>     | <b>language experience</b>       | <b>role playing and drama</b> |

- Promote understanding using demonstrations and think-alouds that model thinking processes and behavior.
- Present materials in a variety of ways: orally, visually, graphically, and auditorially.
- Elaborate on figurative language and idiomatic expressions, which are not universal figures of speech, through paraphrasing, use of concrete examples, and development of meaningful connections to the context and graphic representations.
- Emphasize key words and phrases using intonation and repetition.
- Summarize key points on the board or an overhead transparency as you speak and model the lesson.
- Include the English language learner in all classroom activities. The more the student feels a part of the class, the higher his or her motivation to learn English.

## Organizing the Classroom for Learning

Various classroom organizational patterns and tools can be used to help the LEP student grasp the content. Members of learning groups and pairs should be rotated in order to provide the student with varying language and learning style experiences within the classroom. Consider pairing second language learners with same-language peers. Other grouping strategies include the following:

- flexible grouping (mixed-ability groups based on students' interests/experiences; similar-ability groups based on students' needs/abilities; cooperative groups; or whole-class activities);
- paired learning (peer buddies, pairing more proficient second language learners with less proficient learners; or buddies, pairing same-grade native speakers with second language learners); and
- cross-age tutoring.

Additionally, teachers can draw on a number of instructional supports and resources to assist LEP students. Of particular value to these students is ongoing access to visual and auditory support for learning.

### INSTRUCTIONAL SUPPORTS

- Use of bilingual dictionaries in the classroom.
- Use of parent volunteers to tape, transcribe, or prepare a written explanation of difficult concepts in the native language.
- Collaboration between bilingual/ESL and mainstream classroom educators.
- Provision of content area lessons/topics on cassette tape or in written form for learners to take home to study as supplements to class discussion.
- Access to native language content texts, available through the library system, in nearby schools, or from parent or senior-citizen volunteers.

### ADDITIONAL RESOURCES

- Close-captioned video or TV
- Franklin speaking dictionaries
- Electronic translators
- Computer programs
- Teacher-made adaptations, outlines, and study guides
- High interest/low-reading-level content materials
- Books with audio tapes
- Music plus tape recorder (slows down speech on tape)
- Native language reference materials
- Specially taped materials for bilingual/ESL classrooms

## CHECKING FOR STUDENT UNDERSTANDING

Teachers need to use a variety of strategies for monitoring student progress and to adjust their strategies and expectations to fit the level of language proficiency of the English language learner. With beginning language learners, emphasis should be on comprehension of named things and actions; more advanced students should begin demonstrating understanding of connections between things and subsequently their ability to articulate the relationship between ideas. Content area teachers should work closely with the bilingual/ESL teacher to identify instructional and assessment strategies that are appropriate to all aspects of the student's development and that permit teachers to expand expectations gradually over the school year.

Successful strategies for monitoring student progress in the content areas include:

- Providing periodic checks for understanding.
- Promoting nonverbal as well as verbal participation.
- Encouraging students to think aloud to practice concepts.
- Modeling responses that provide appropriate information using correct grammar.
- Breaking tasks down into sequentially developed parts using simple language.
- Structuring questions to student's language level (e.g., begin with yes/no and embedded questions and advance to open-ended questions).
- Avoiding use of questioning techniques that contain negative structures, such as "all but", "everything is \_\_\_\_\_ except", or "one is NOT the reason/cause."
- Rephrasing questions and information when students do not understand the first time.
- Observing student's behaviors for evidence that they understand assignments, directions, and instructions.
- Reviewing student's work for evidence that they understand assignments, directions, and instructions.
- Using visual reviews (e.g., lists and charts) that enable students to show what they know and can do.
- Providing increased "wait time" to allow students time to process questions before responding.
- Providing modified "double" grading to assess the content as well as the structure of responses.

Four over-arching strategies are most effective for assisting students from a background of limited English proficiency (LEP) to meet success in content area classes. These strategies include the following:

- integrate activities into thematic units
- tap students' prior knowledge and experience
- teach learning strategies and scaffold complex tasks
- group students into a variety of learning groups



Each of these strategies will be expanded below with specific practices to assist English language learners. Following this, content-specific strategies and sample lesson plans are offered at various grade-level clusters based on the major strategies below. In all cases, the lessons were designed for use with a content area class consisting of five LEP students, 15 or more native English speakers, and a content area teacher. The LEP students participate most fully if they have attained at least an intermediate language proficiency level. For students below that level, the ESL teacher should take the lead in presenting content information.

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### Strategies for Instruction

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1. **Integrate activities into thematic units.** One of the ways students learn best is through repetition: of ideas, of words, of actions. When concepts to be developed are being reinforced across several content areas, students benefit from seeing and hearing the same information or vocabulary over and over. English language learners will have more opportunities to use key words and practice desired skills when they work with the same concepts in several classes. Developing and teaching thematic units across content areas takes joint planning by a number of teachers. Certainly, the ESL teacher needs to be involved in the planning. In many cases, the ESL class can reinforce the language skills needed by the students to successfully complete the content area activities. Often, the ESL teacher can suggest ways to assess the student's understanding without depending heavily on language-based tests. In the case of thematic approaches to learning, it is certainly true that "many hands lighten the load."
2. **Tap student's prior knowledge and experience, which differ from that of other students in the class.** In the case of immigrant students as well as others who are acquiring English, prior knowledge cannot be taken for granted. Before introducing a new unit or concept, it is wise to find out what information students already have about it. However, students who have not lived in New Jersey all their lives may have a very different background understanding than those born here. The entire class can be multiculturally enriched, but the need to tap into a variety of students' perceptions and experiences still exists. For example, a New Jersey student's understanding of elephant, ostrich, and llama may simply reflect animals found in a zoo. On the other hand, students from Thailand, Australia, and Peru may think of them as farm animals.

With regard to concepts that are typically American (historical figures, artists, fast foods), teachers are advised to expect little or no background knowledge and to "build in first-hand experiences." References to television programs, holiday practices, or geographic areas may mean nothing to LEP students. They will not have mental maps of the United States to draw from when Seattle or Miami are mentioned. They will not be likely to defend the Redskins against the Cowboys, or recognize fireworks as symbolic of July. They will, most likely, know distances to other cities, follow other sports teams, or celebrate different holidays. Teachers need to make every effort to explain concepts related to the lesson; a peer tutor can be enlisted in explaining concepts to LEP students.

3. **Teach learning strategies and scaffold complex tasks.** Much has been written recently about students' needs to develop strategies for learning. Some learners have developed a few strategies to help make sense of their learning. Now, teachers at all levels are encouraged to model and demonstrate thinking and learning strategies. Graphic organizers are invaluable tools to create visual relationships between concepts. All students benefit when information is organized graphically for them. Overtly teaching students to reflect on how they are doing, what they are understanding, and what else they need to know will help them to be successful. Appealing to multiple intelligences within the context of a single unit of study enables students to develop or enhance a variety of skill areas. English language learners may have developed strategies different from those of other students. They can be encouraged to share their own learning approaches with the whole class since it builds self-esteem.

English language learners need to be challenged by complex concepts, but they will be better able to grasp complexities if tasks or information is scaffolded by what has gone before. As with the effectiveness of thematic units, scaffolding learning by building in foundation skills will aid LEP students' understanding.

4. **Group students into a variety of learning groups.** English is learned most efficiently when it is used to conduct meaningful, natural communication. To encourage English learning, students need many opportunities to talk, use new vocabulary, and to share ideas with their peers. These opportunities are most available to them when they learn in cooperative learning groups, pairs, or other small-group settings. In classes with native speakers of English, LEP students will hear the content area language modeled by their peers, and have more chance to use it when they participate in group work. Students who have not yet attained intermediate proficiency can shadow the work of a native-English-speaking peer in paired work. Students with greater ability can contribute their ideas in groups of four or five while someone else restates the comments in standard oral or written form. Groups can be formed and disbanded into a variety of sizes depending on the nature of the task. LEP students can be grouped together to develop some background cultural knowledge; then a single language learner can be matched with three native speakers to complete a graphic organizer. However, in all cases, limited English learners benefit from working with peers and from having more chances to use the language.

## SCIENCE AND THE LEP STUDENT

The suggested strategies and adaptations offered above will prove helpful to any teacher of students with limited command of English, and can be used to modify virtually every teaching activity. The science classroom, with a regular and heavy reliance on “hands on” exploration of each student’s world, can provide a unique opportunity for the LEP student to display his/her abilities, less restricted by difficulties with language. Hence, science instruction can especially benefit from an application of these ideas, and it is recommended that the LEP science teacher regularly refer to these pages when planning investigative activities.

Particularly useful strategies for enhancing “hands-on” investigations include:

- Label objects, apparatus, models, organisms and their parts, etc. as an activity is being explained.
- Model investigative procedures and techniques. Do not rely on a set of written directions from a lab manual.
- Assemble lab teams in a way that provides the LEP student with comfort and assistance as well as diversity.
- Maintain a classroom/laboratory with labeled exhibits, such as weather station, in an attempt to display the instruments and tools used by scientists.
- Science Standard #3 calls for understanding the contributions of many cultures throughout history to the development of science. Seek opportunities to include these contributions regularly in your teaching.

## SCIENCE INSTRUCTIONAL STRATEGIES FOR LEP STUDENTS

Suggested strategies for adapting science instruction for LEP students are given on the following pages, alongside the learning activities. The four sets of strategies were designed to illustrate science instructional adaptations at the K-2, 3-4, 5-8, and 9-12 grade levels, respectively.

Science Standard 10 – Indicator 3 (Gr. K-2)  
 Science Standard 10 – Indicator 4 (Gr. 3-4)  
 Science Standard 12 – Indicator 4 (Gr. 5-8)  
 Science Standard 6 – Indicator 17 (Gr. 9-12)

## SCIENCE STANDARD 6

*All students will gain an understanding of the structure, characteristics, and basic needs of organisms.*

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**Indicator 17:** *Compare and contrast the life cycles of living things as they interact with ecosystems.*

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### LEARNING DEMONSTRATION ACTIVITIES: Grades 9-12

**Effect of Environmental Factors on Germinating Seeds.** In the following activities, students investigate the response of the roots and stems of germinating corn or bean seeds to such environmental factors as gravity, light, and water.

- To investigate the response of germinating roots and stems to gravity, students place four soaked corn or bean seeds on barely moist paper towels that are pressed into a petri dish. The seeds should be at the 3 o'clock, 6 o'clock, 9 o'clock, and 12 o'clock positions. The students then stand the petri dish on edge in a fixed position and check daily for the direction of growth of the emerging root and shoot.
- As an extension, students work in cooperative lab groups to design their own experiments testing the responses of germinating seeds to the direction of a light source or a water source. Students focus not only on the design of their experiments but also on writing detailed procedures. (They will swap experimental designs and procedures with another group before carrying out the experiment.)

#### Strategies for LEP students:

Demonstration lessons by the teacher provide students with a model for thinking, writing, reading, speaking, and communicating in a new language.

Hands-on project work assists students in understanding concepts that link new knowledge to previously learned knowledge and experiences in one's own culture.

Journal writing is an excellent activity for students to synthesize, analyze, and reflect on their reading, learning, and life experiences.

Working to ensure students understanding can be achieved through expanding, restating, and reinforcing important points.

## SCIENCE STANDARD 10

*All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.*

**Indicator 3:** *Identify major sources and uses of water, discussing the forms in which it appears.*

### LEARNING DEMONSTRATION ACTIVITIES: Grades K-2

**Water-Cycle Plays.** Student groups create and act out stories about the water cycle. Using some type of costuming or pictures on craft sticks, the students depict the travels of a water droplet through the water cycle, e.g.,

- A raindrop forms in a cloud and falls on a hill.
- It runs into a stream, which flows into a river, a bay, and the ocean.
- It evaporates and goes into a cloud, and the cycle continues.

Play audiotapes of environmental sounds (e.g., rain, rushing streams, or waves on a beach) while students act out their plays.

Help students realize that some water is “held up” in lakes, aquifers, and puddles and so is not flowing through the water cycle. Discuss with them how water is used by plants and animals (including humans). Students can collect pictures of how people use water and create a classroom display.

**Forms of Water.** Students pour some water into a clear container, then mark how high the water level is. They observe what the water looks like in its liquid state. They then freeze the water until it is completely solid. Ask students to predict what will happen to the volume (height) of the water. They can

#### Strategies for LEP students:

Acting out a story is another way to help kids think actively and to visualize what they learned.

Hearing recorded sounds or listening to books on audiotapes helps students to hear the language spoken with modeled voice intonation and pronunciation.

Forms of Water. Students pour some water into a clear container, then mark how high the water level is. They act with ecosystems.

Teaching the same concepts to all students through differentiated instruction allows the teacher to address different learning styles, abilities, and varied learning experiences.

Assist the LEP student by labeling objects and pointing to those objects as the activity is being explained and modeled.

Pair a less proficient with a more proficient English-speaking student to encourage risk-taking and increase the student’s comfort level.

draw pictures or write journal entries to show their predictions. The students observe the ice to see how the water has changed in appearance and size.

After marking the level of the ice, the students lightly cover the cups with plastic wrap (to prevent evaporation) and let the ice melt completely. They again observe the water and its volume. They compare the volume of the water in the liquid state before and after it was frozen.

Students discuss occasions when they have noticed that water seemed to disappear. They then fill two cups with water and cover only one cup with plastic wrap. They place both cups of water on a windowsill. The students observe and record the height of the water in each cup daily. What is happening to the water? Where has it gone?

## SCIENCE STANDARD 10

*All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.*

**Indicator 4:** *Collect and record weather data to identify existing weather conditions, and recognize how those conditions affect our daily lives.*

### LEARNING DEMONSTRATION ACTIVITIES: Grades 3-4

**Weather Station.** Students establish a class weather station using homemade or basic instrumentation such as a thermometer, barometer, rain gauge, wind vane, and anemometer.

**Daily Weather Journals.** Students write daily weather conditions in their weather journals. Entries might include

- readings from the instrumentation in their class weather station
- observations regarding cloud types, condition of air, amount and kind of precipitation
- present weather conditions obtained from a weather center (e.g., radio, television, or Internet)

In their journal entries, students could also write about the type of clothing they could wear outdoors and what activities they could do that day.

Students examine their data and learn to recognize certain patterns of seasons (e.g., storms vs. fair weather). Challenge students to examine their data more closely by asking them if there is any connection between their barometer readings and the prevailing weather conditions. The students can create video or multimedia presentations reporting their discoveries.

#### Strategies for LEP students:

The K-W-L strategy (what you know, what you want to learn, what you learned) aids students comprehension and vocabulary development, enabling them to connect the new to the known.

| K | W | L |
|---|---|---|
|   |   |   |
|   |   |   |

Place a copy of the daily weather map on bulletin board for student reference.

Develop a set of flash cards with weather terms so those students can use them to review the terms used in weather reporting.

Choose favorite science and informational books for weekly shared reading so that LEP students hear and appreciate the beauty of both written and spoken language.

## SCIENCE STANDARD 12

*All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.*

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***Indicator 4: Evaluate the impact of personal and societal on the local and global environments.***

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### LEARNING DEMONSTRATION ACTIVITIES: Grades 5-8

**Providing Basic Needs.** Students first discuss the basic needs of humans (e.g., water, air, shelter, food, open space). Obtain a piece of rope long enough to form a circle for the entire group to step into and stand comfortably, then place the rope on the ground. Ask the students to step inside the circle, then instruct them to step outside the circle. Explain to the group that part of their environment has been impacted due to development. Reduce the size of the rope, and ask the group to again enter the space provided inside the circle. Decrease the size of the circle using various issues that pertain to the loss of habitat or of a basic need (e.g., water pollution, roadways, litter).

Ask the group to explain what happened as they lost a portion of area or of that resource. Discuss how both plant and animal species in this area might adapt and deal with the changing situation. What are their options? Challenge the group to identify potential solutions that would prevent such losses, or have them bring in newspaper articles that represent this occurrence.

#### Strategies for LEP students:

Draw on prior knowledge and have students brainstorm and think about what they and others need in order to survive each day. Ask them to list what they already know about the environment and identify ways that we impact on local and global environments.

Identify and share specific vocabulary words several days prior to the introduced lesson so those students can learn and use new words in meaningful contexts.

Keeping a vocabulary notebook is helpful to students. This medium gives the LEP student a tool for seeing and copying words in context, and using words in a language that is understandable to them.

Using a variety of visual clues like encyclopedias, informational books, newspapers, magazines, and bilingual dictionaries increases students understanding of difficult concepts.



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